

CRODA

Innovation every day



We are the name behind the high performance ingredients and technologies in some of the biggest, most successful brands in the world; creating, making and selling speciality chemicals that are relied on by industries and consumers everywhere.

In this year's report

2016

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Where we operate

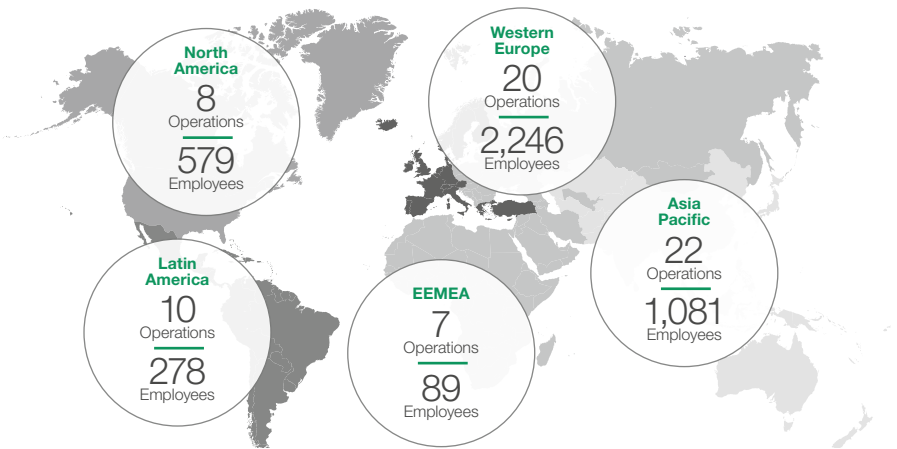
36

Countries across the world

4,273

Employees

Every day our global team works together, inspiring and influencing each other and our customers.



Our strategy

Shaped by three global mega trends:



Delivering Growth

Delivering consistent top and bottom line growth



Driving Innovation

Increasing the proportion of protected innovation



Sustainable Solutions

Accelerating our customers' transition to sustainable solutions



Read more about how we are maximising opportunities for growth on **p02-03**

Our Material Areas

10



Environmental Impact



Process Safety



Occupational Health & Safety



Product Stewardship



Product Design



Quality Assurance



Our People



Knowledge Management



Diversity & Inclusion



Community Education & Involvement



Read our 2016 Material Area Performance Summary on **p28-31**

Global Reporting Initiative (GRI)

Our 2016 report is in accordance with the new GRI Standards: Core for the period 1 January 2016 to 31 December 2016. Throughout this report, look out for the green reference box shown below, which indicates where information against our chosen GRI disclosures can be found.

GRI Standard Number



Read our full 2016 GRI Report online at www.croda.com/GRI

Growing a more sustainable business



Steve Foots
Group Chief Executive



We are passionate about sustainability, a key component of our growth plans. It is through our extensive knowledge of the markets we serve that we continue to work closely with our customers to create, make and sell the sustainable innovations that they need to meet the demands of the consumers they serve."

As our strategy continues to be shaped by the way we respond to global mega trends (p02) we drive top and bottom line growth through product and process innovation, creating new ways to address future challenges and opportunities; and our commitment to sustainability, which is increasingly a means of differentiating ourselves from our competitors, as well as being the right thing to do.

Sustainability is the thread that connects every aspect of our Business

In 2016, we have continued to lead our industry with almost two thirds of our raw materials being derived from natural and renewable resources (p08). Through our progressive work to deliver products containing certified sustainable palm oil derivatives, for which we have received peer recognition, we have worked closely with our suppliers and the Roundtable

on Sustainable Palm Oil (RSPO) to achieve RSPO certification at 12 of our manufacturing sites (p10). This activity has also given us greater traceability of the palm oil derivatives we use, and our work with Sedex across our raw material supply chains is providing increased transparency on other social and ethical practices (p12).

Our New and Protected Products (NPPs) met an average of 11.6 of the 12 Principles of Green Chemistry in 2016. This industry recognised, independent standard continues to be used in the development of all of our products. We are also placing an even greater focus on measuring their benefits in use (p09).

As we move forward with our plans for growth, we always consider how to reduce environmental impacts. A major example in 2016 includes work at our Atlas Point manufacturing site in North America to build a bio-ethylene oxide plant for the manufacture of 100% renewable surfactants, which will be powered by landfill gas (p16). We also made a significant investment in power generation from bio-gas at our Gouda site in the Netherlands (p18) and to reduce water consumption from a stressed aquifer at our Mevisa site in Spain (p16).

Our people are at the heart of sustainability

We know that our people underpin everything we do, their shared values and can do attitude are fundamental to the Croda culture, which we believe is a key business differentiator that plays a significant role in our continued success. In 2016, we continued to invest in our people and the communities in which we operate with over 102,000 recorded training hours during the year (p22) and more than £115,000 in-kind donations through our 1% Club employee volunteering programme, 48% of which focused on educational programmes (p24).

A new impact based way of reporting our sustainability story

This year you will notice that we have moved to a different way of reporting. This is in response to our stakeholders telling us they wanted to hear more about the compelling story of our sustainability credentials and its impact on our Business, our customers and the world in which we operate. Whilst the 10 Material Areas are still key to the way we manage and measure our performance against set targets (p28-31), in this report we want to illustrate our key sustainability credentials across: Sustainable Product Innovation (p07); Planet and Process (p14) and People and Community (p20).

Looking forward

Our approach to sustainability means that we are ideally positioned to help our customers achieve their current and future sustainability targets. We will continue to do this by meeting their demands for sustainable products through the raw materials we use and the way we create and make them, to the benefits they deliver during use by consumers.

I am proud of how our local teams form global networks, working together to inspire each other to meet the unique needs of industries and consumers everywhere. I would like to thank everyone across the Group for the contributions they make to sustainability every day.

Steve Foots
Group Chief Executive

Market Opportunities and Strategy

Maximising opportunities for growth

Our strategy is shaped by our response to three global mega trends, which all relate to the rapid expansion of the world's population. They provide opportunities for us to maximise our growth by delivering product benefits to consumers and also to futureproof our Business.

Global Mega Trends

Changing demographics

Largely due to revolutions in sanitation and health care over the last 100 years, people in developed economies are living longer and have more income and better access to buy a wider range of health, beauty and wellbeing products. In the developing world, population growth is driven by lower mortality rates which, together with an expanding middle class, is generating new markets for products that make a difference to living standards.

Fragile world

The impacts of global warming are accelerating as a result of increasing greenhouse gas emissions from the burning of more fossil fuels by an expanding population, coupled with the degradation of the natural means of the planet to counteract these effects. The consequences include water and land shortages and crop failure at a time when the world needs to support a growing population. Regulators are also demanding more stringent standards of environmental and social protection.

Changing expectations and behaviours

Fuelled by the convergence of social, mobile and 'big data', consumers' expectations are changing. They want greater choice and control, demanding more transparency in the products and services they use and anywhere, anytime access to information. Digital technologies make it easier for them to have their voices heard and also increase the speed at which new trends are adopted. Reacting to these demands, businesses are engaging start-ups, small independent ('Indie') customers and virtual communities as co-creators.



» To find out how we create value, read our business model on **p04-05**

Our Strategic Approach



Delivering Growth

Through our direct selling business model, our people build intimate relationships with our customers large and small, working closely with them to target niche, rapidly growing markets where our innovative and sustainable approach is valued. We have a flexible and agile structure for growth that enables our people to stay local to our customers around the world, whilst working together as one global team to respond quickly to demands identified by changing demographics in a fragile world.



Driving Innovation

Innovation plays a critical role across our Business, with dedicated business sector Research and Development teams developing new ingredients in collaboration with our customers. Working with our open innovation partners identifies unique opportunities that add value to our customers' products and satisfies the needs of their consumers. It is a combination of our products and the way we operate that enables our customers to build on our innovations, so that together we address the challenges of the global mega trends.



Sustainable Solutions

We continue to build on our renewable raw material heritage to create, make and sell sustainable solutions today, to positively influence tomorrow. Through the investments we make in innovative product design and flexible operations, we are working with our supply chain to develop products that deliver more benefit, with less impact. This, coupled with active participation in regulatory debates, ensures that we are at the forefront of providing answers to the challenges presented by the three global mega trends.

Our difference

Our long term growth is driven by what makes us different, which includes:

- Our global culture driven by shared values and a 'can do' attitude
- Our intimate customer relationships, from niche 'Indie' customers to large multinationals
- Our agility in responding to customer needs built through local sales and technical teams with a global focus
- Our selective acquisitions and capital investments
- Our agile regional manufacturing bases.
- Our valuable protected intellectual property and an extensive innovation pipeline
- Our exceptional product performance and claims validation, coupled with first class regulatory support and quality testing
- Our extensive open innovation partnerships.
- Our knowledgeable and talented people
- Our valuable sustainable chemistry that focuses on intrinsic and extrinsic sustainability product benefits, where we apply independent third party guidelines
- Our focus on building transparency and traceability throughout our supply chain.

Creating value

The way we operate and our innovative products create sustainable environmental, social and financial value including:

- Our culture brings exceptional customer service and ability to manage complexity by working together
- Our agility allows us to respond quickly to our customers' needs in response to the global mega trends
- Our investments support top-line momentum, ensuring that we deliver shareholder value.
- Our new and protected products generate valuable revenue streams
- Our product data package provides customer and consumer confidence in our innovation
- Our investment in innovation and our peoples' industry insight helps to futureproof our Business.
- Our people deliver environmental, social and financial returns
- Our global, sustainable innovation delivers products with minimal environmental impact and maximum benefit
- Our investment in supply chain transparency develops growing trust with customers and consumers.

Business Model

Creating value

We create long term value through collaboration with our customers, our proactive and creative attitude and our ability to think differently. Our agile structure allows us to adapt in response to global mega trends as we turn exciting, often groundbreaking ideas into practical solutions that enhance a diverse range of products.

Consumer demand

Influenced by global mega trends, consumers dictate the unmet needs across our four market sectors

Customer need

Our customers seek innovative products that address consumer needs

Croda

We work in close partnership with our customers and supply chain, offering innovative and sustainable products that are supported by exceptional performance and claims validation, enabling our customers to deliver the benefits consumers demand across our four market sectors of:

Personal Care

Life Sciences

Personal Care

We are the world's leading supplier of speciality ingredients for the personal care (PC) industry, offering our customers expertise in formulation development, claims substantiation, market analysis and regulatory support. Our ingredients are used in a range of applications including skin care, hair care, sun protection and colour cosmetic products.

p06 Read about the benefits of our PC innovation every day

Life Sciences

Health Care, Crop Protection and Seed Enhancement are three complementary businesses within our Life Sciences (LS) market sector. Health Care delivers high quality ingredients and formulation expertise into pharmaceutical, nutritional, dermatological and animal health products. Crop Protection and Seed Enhancement provides innovative ingredients and formulation expertise to agrochemical companies to help farmers achieve superior yields.

p13 Read about the benefits of our LS innovation every day

Engage

Working closely with our customers and supply chain we identify unmet consumer needs around the world



Create

We create innovative and sustainable products and technologies that meet consumer demands



Performance Technologies

Industrial Chemicals

Customer formulation

Our customers use our products to enhance their formulations to meet their consumers' needs

Consumer benefit

Our innovative products meet consumer demands by addressing their unmet needs

Make

Our manufacturing sites run flexible operations to consistently high standards across the world



Sell

We generate revenue through our direct selling model, with sales, technical and warehousing support local to our customers



Performance Technologies

Within Performance Technologies (PT) there are five business areas delivering innovative ingredients to a wide range of niche, mostly industrial markets: Lubricants supplies automotive and industrial lubricants companies; Coatings and Polymers serves the coatings, adhesives and speciality polymers markets; Polymer Additives sells into the plastics and packaging sector; Geo Technologies supports customers in oil and gas, water treatment and mining; and Home Care supports household product manufacturers, as well as industrial cleaning companies.

p19 Read about the benefits of our PT innovation every day

Industrial Chemicals

Industrial Chemicals (IC) is a small, diverse market sector selling co-streams, undertaking toll processing and developing novel niche applications for thermal management, catalysts, electronics, advanced ceramics and other industrial applications.

p26 Read about the benefits of our IC innovation every day

Innovation every day

Increasing effectiveness

Our specialist polymers improve the water resistance and durability of sun creams, increasing effectiveness while reducing the frequency of applications, resulting in a saving in the amount of product consumers need to use.

Reducing energy

We have ingredients that enable our customers to make their creams and lotions at lower temperatures, reducing energy requirements and cost of manufacture.

Resource efficiency

Our formulation experts work closely with our customers to help them get the desired effects from our ingredients, reducing time, energy and amount of ingredients used in customer product development.

Improved wellbeing

Our highly effective anti-ageing peptides have been proven to help improve skin elasticity and reduce the visibility of wrinkles, enabling consumers to see results from a single product.

Reducing environmental impact

Some of our active ingredients are created using bio-technology, reducing their environmental impact.

Sustainable Product Innovation

Making high performance, high quality products with the sustainable benefits our customers want

At Croda, product innovation and sustainability go hand in hand with customer intimacy.

We know that it is only by being close to our customers that we can understand and fulfil their needs in terms of new ways to improve sustainable product performance and reduce negative impacts. We assess the everyday impact of our products in two ways: *intrinsic*, referring to attributes such as renewable raw material content, product purity and cradle to gate carbon footprint; and *extrinsic*, which refers to the social, environmental and financial impacts our products have in use or as they biodegrade at the end of their life.

Our customers respond to consumer concerns, which are strongly influenced by health and the environment, leading to their demands for products that have low social and environmental impact while offering cost benefits. From our focus on innovation in product design and the way we ensure supply chain transparency and traceability of raw materials, to the steps we take to safeguard customer satisfaction through our rigorous quality assurance processes; we continually seek to differentiate ourselves through our sustainability programme, futureproofing our Business through the value and product advantages we bring to our customers.

Key Material Areas



Product Design

Deliver the most innovative and sustainable ingredients to our customers



Product Stewardship

Ensure that the ingredients we produce contribute positively to the environment and society throughout their lifecycle



Environmental Impact

Minimise the impact of our operations



Quality Assurance

Contribute to, and proactively seek, higher quality standards across product and operational aspects of our Business to ensure consumer safety

Highlights

62%

of our raw materials were from renewable sources, an industry leading position [p08](#)

11 or 12

is the score our new ingredients mostly meet against the 12 Principles of Green Chemistry [p09](#)

63%

increase in sales of products made with RSPO certified palm oil derivatives compared to 2015 [p10](#)

CDP

awarded us A- for our Forest Report on palm oil, putting us amongst just 15 others to achieve this score [p10](#)

Top 1%

with Gold Status is where we are placed amongst all companies assessed by the sustainability platform EcoVadis [p12](#)

EXCiPACT

certification has been received at all of our manufacturing sites supplying to the pharmaceutical industry [p09](#)

12 Principles of Green Chemistry

We continue to apply the 12 Principles of Green Chemistry* (the Principles) as an industry recognised independent framework to assess our New and Protected Products (NPP). On average, our 2016 NPP launches met 11.6 of the 12 Principles and a review of our key existing products, the top 25 by value across our Business, met an average of 11.3, demonstrating our consistently strong performance in this area. Atplus™ DRT-100 is a top 25 product that meets all the Principles, it is 100% renewable and enables more accurate application of pesticides, reducing their negative impact on the surrounding environment.

* Anastas, P. T.; Warner, J. C. Green Chemistry: Theory and Practice, Oxford University Press, New York, 1998



Demonstrating sustainable value to our customers

Knowing that our customers focus on different aspects of sustainability across the industries we serve, during 2016 we introduced the concept of intrinsic and extrinsic benefits to help them make more informed decisions on our products. In the area of intrinsic benefits, our Research and Development (R&D) teams continue to measure the sustainability of our New and Protected Products (NPPs) and in 2016 they included a number of our existing products, starting with our top selling 25 by value.

Intrinsic refers to attributes such as renewable raw material content, the purity of our products and cradle to gate carbon footprint.

Extrinsic refers to the social, environmental and financial impacts our products may have in use by our customers or their consumers, or as they biodegrade at the end of their life.

By measuring the renewability of our raw materials and by using the 12 Principles of Green Chemistry (the Principles) (Anastas, P. T.; Warner, J. C. Green Chemistry: Theory and Practice, Oxford University Press, New York, 1998), which we have applied to NPP development since 2008, we believe that we are giving our customers a consistent picture of the intrinsic sustainability of our products by applying independent industry guidelines.

To ensure that we focus on delivering the intrinsic and extrinsic data that our customers need, we are also now working more closely with their sustainability specialists to better understand their information needs. Our 2016 activities in this area included identifying the key customers and products for which we will need to offer more detailed and aligned data during 2017, such as further carbon footprint analysis and demonstration of the value of our products in use.

Intrinsic sustainability

The intrinsic sustainability of our products continues to be of vital importance to us, our customers and their consumers who increasingly demand products with ever higher sustainability credentials in line with the global mega trends. We are helping more of our customers reduce the carbon footprint of their formulations by providing timely and relevant information on the impact that the supply of our product has on their

greenhouse gas (GHG) emissions. The fact that our renewable raw materials capture carbon dioxide from the atmosphere during their growth can be a major benefit to our customers GHG inventories.

For all industries, the historic agreement to hold global warming to no more than 2°C above pre-industrial levels was the most significant outcome of COP21, requiring a huge reduction in the reliance on fossil fuels by the end of the century. The chemical industry is traditionally energy intensive and faces substantial technical challenges to reduce its emissions if COP21 objectives are to be met; it is estimated that achieving this will require the industry to meet a 50% reduction in carbon emissions by 2050. Our product portfolio is largely built on renewable raw materials, in 2016 almost two thirds of the raw materials we used were renewable, which differentiates us from our peers. This, coupled with the investments we have made in energy efficiency and renewable heat and power, gives us a clear and sustainable advantage.

The proportion of renewable raw materials in speciality chemicals manufacturing seldom exceeds levels of 10%. In contrast, our use of renewable raw materials is normally in the range 62-72%, with the figure in 2016 being 62%. This is a unique position and it is one of the areas where we are leading the way for a more sustainable chemical industry. This point of differentiation helps to futureproof our profitability as many of our customers have now targeted to reduce their environmental impact by increasing the proportion of renewables in their products.

The key environmental benefit of using renewables is that when the raw materials are growing they are absorbing carbon in the form of atmospheric CO₂, in contrast to petrochemical materials. One significant obstacle to achieving 100% renewability for many chemical products has traditionally been the need to use petrochemically derived ethylene oxide (EO) as a key raw material. In 2015, we began construction of a US\$170 million bio-ethylene oxide (bio-EO) plant at our Atlas Point manufacturing site in North America. This will be the first bio-EO plant constructed in the USA and will enable the use of bio-ethanol derived from natural feedstocks for the manufacture of 100% renewable surfactants.

As this new bio-based ECO range of surfactants, due for launch in 2017, will be made using bio-EO made at the same location, we have eliminated the need for the rail transportation of thousands of tonnes of petrochemical derived EO from the Gulf Coast. In addition, the heat and electricity for making our bio-EO is generated on site from methane gas supplied from a local municipal landfill site and is, therefore, largely non-fossil. Once available, this ECO range will meet consumer demands as there is no change to product performance, but there is a huge sustainability benefit as they are 100% renewable, 100% bio-based and manufactured with green energy.



ECO range of bio-based Products

Case study

The story of a low carbon product

Pripol™ 1006, Priplast™ 1838 and Priplast 3186 are high performance oleochemicals for the coatings and adhesives sector, manufactured at our Gouda site in the Netherlands.

They all come from the same renewable raw material, rapeseed oil. This intrinsic sustainability benefit is enhanced by the green manufacturing processes at Gouda as the site uses bio-gas, a renewable fuel, as energy for production. The site also recycles its waste water by reverse osmosis, which purifies it for re-use as boiler feed water.

This holistic approach to sustainable manufacturing, coupled with renewable raw materials, enables us to offer products with a much lower carbon footprint than petrochemical alternatives.



Use of renewable feedstocks is the seventh item in the 12 Principles of Green Chemistry. Five of the principles are solely focused on product, whilst the remaining measure the sustainability of processes, which we focus on within the Planet and Process aspect of our sustainability story (p14).

In 2016, our NPPs met an average of 11.6 against the Principles and our top 25 existing products by value averaged 11.3. One of our highest performers within the latter category with a score of 12 is Pharmalan™, a pharmaceutical grade of lanolin that is 100% renewable and offers skin healing effects for injuries such as burns, an example of a very positive social benefit from a high performing intrinsically sustainable product.

Q Case study

Ensuring product safety

As many of our ingredients are in end products that are used directly by consumers, we are legally and morally obliged to ensure their safety in use.

In particular, product safety in the pharmaceutical and personal care sectors is a major concern, so it is vital that we achieve the highest standards for the reassurance of our customers and their consumers.

In 2016 we completed our Quality Assurance objective to have all of our manufacturing sites that supply excipients to the EXCiPACT Good Manufacturing Practice (GMP) standard, matching the status of all of our cosmetic ingredient sites that had already achieved EEFICI GMP certification in 2015.

Our Quality Assurance team was instrumental in designing the EXCiPACT and EEFICI GMP standards and our proactivity in this area aligns well with our focus on providing our customers' with complete quality reassurance.



Extrinsic sustainability

Based on our intimate knowledge of our markets and customers' we know that there is a range of differing demands for information about the sustainability benefits of our products. These requirements are dependent on the product application, so consumers need assurances about the environmental impacts of the products they are using, for example.

In 2016 we have continued to launch many new innovations, all of which have intrinsic or extrinsic sustainability benefits, or both. For instance, within our range of crop spraying adjuvants we introduced a new drift reduction agent called Aplus™ DRT-100 for the agriculture industry, where reducing off-target spray drift has long been a major concern. To investigate how we could optimise drop size and shape in order to target spraying accurately onto crops, we invested nearly US\$1 million into a low-speed wind tunnel in North America to aid the development of Aplus DRT-100. This product enables farmers to minimise the waste of expensive products, such as pesticides, whilst also reducing the negative impacts on the surrounding environment and wildlife. As well as these extrinsic sustainability impacts, Aplus DRT-100 is made from 100% renewable raw materials, making it an all-round intrinsic and extrinsic performer.



On target performance with Aplus™ DRT-100

Another of our protected products, the Maxemul™ 6 series of non-migratory surfactants, allows formulators to replace solvents in coatings, such as paints, with water based alternatives, whilst boasting enhanced properties: typically only included into formulations at 0.5-2%, it allows our customers to eliminate up to 50% of the solvents used in traditional paints. Our customers can also improve final product performance, whilst replacing unsustainable and potentially more costly ingredients, saving money and improving their sustainability profile. Although the

Maxemul 6 series was developed a few years ago, in 2016 we identified a growing interest in the technology, which we responded to by investing in formulation and application support to develop new tailored Maxemul grades that help our customers to shorten their product development time and sell more sustainable coatings into more applications around the world.

In 2016, we also assessed our top 25 products by value to ensure that we are promoting all of their sustainability benefits in use. For example, Priolube™ 3970 is used in lubricants for wind turbine gearboxes, which enables the key components of this source of green energy to operate more efficiently and with lower maintenance costs. Omerex™ EE is a highly purified omega 3 concentrate, which is made using sustainably sourced fish oil and, as it can be used at lower levels compared to its counterparts for the treatment of cardiac conditions, less raw materials are needed. Many more of these extrinsic sustainability benefits are highlighted in our product case studies on pages 06, 12, 19 and 26.

In the coming years we intend to expand our analysis of the intrinsic and extrinsic impacts of our NPPs and top 25 products by identifying further products in our portfolio with attractive sustainability attributes unique to Croda, making that information available as part of our service to new and existing customers. Moreover, extrinsic benefits are firmly on our agenda as a point of focus for future growth as they offer clear competitive advantage and real business value to our customers. For instance, we have achieved preliminary approval for our investment in anti-microbial technology: MyCroFence™. Added to paint for use in hospitals, schools, kitchens and bathrooms, for example, this product prevents algae, fungi and bacterial growth on surfaces, replacing the more toxic ingredients in current use. It also has a long lasting effect, so repainting is required less frequently.

Q Case study

Developing international standards to better inform customers

As part of our strategy of ensuring that customers can make the best decisions concerning the sustainable profile of the ingredients they buy, our Quality Assurance team is involved in the development of a set of European Standards to support the development and use of bio-based products. This is part of the European Commission's initiative on the circular economy.

These standards include a method of calculating the Carbon 14* content of products, which can be used to provide conclusive evidence of the renewable origin of sustainable products, as well as providing a standardised method to communicate bio-based content. We will adopt these standards to demonstrate our commitment to delivering high value and sustainable products.

Also in 2016, based on our previous work in nano materials for products with a sun protection claim, we were asked by Cosmetics Europe to lead a project to develop a system that will help to classify nano materials for cosmetic use.

Both of these examples demonstrate how we contribute to the development of standards that facilitate the delivery of sustainable materials for society.

* Otherwise known as radiocarbon, Carbon 14 is a radioactive isotope of carbon that is naturally present in organic or biomass materials and not those derived from petrochemical raw materials.



Q Case study

A safer, more environmentally sensitive way to achieve plant protection

Seed quality is a crucial factor in global food supply. By 2050, in order to feed the global population, food production will have to increase by 70%.

Yet at the same time the amount of available land and water is decreasing, as is the number of registered plant protection products (PPPs), which include insecticides, fungicides and pesticides in both biological and chemical formulations, due to concerns over their environmental impact. Incotec, our recently acquired Seed Enhancement business, takes this seriously and concentrates entirely on the improvement of the actual seeds.

Incotec has found that applying PPPs directly as a seed coating, rather than spraying the product onto the leaves or ground can reduce the amount required by as much as 80-90%; a tremendous advantage for the product handlers and the environment. It also results in reduced dust emission and, by colour coding the seed coating they are easier to identify for more efficient and precise sowing. We can also add actives and additives to the coatings that promote growth and nutrient uptake, as well as protecting the plant, helping to increase crop yields to satisfy growing global food demand.



Raw materials and the supply chain

All raw materials used in our operations are tested against a specification, as is every batch of product that we make, for maximum customer and consumer reassurance. All our suppliers have to go through a rigorous approval process to check their quality systems and performance, and the origin of all our renewable raw materials is mapped in our global procurement system, so that we know what we buy and where that raw material is sourced.

We are also increasingly vigilant as to whether raw materials contribute to deforestation much further up our supply chains, particularly in the area of oil crops. In filing our CDP Forest Report for palm oil, which aims for deforestation-free supply chains, we were amongst only 15 companies globally to achieve an A- score, behind only L'Oréal and Unilever who scored A.

Our approach to sourcing renewable raw materials has enabled us to continue making acknowledged industry leading progress in achieving the transformation to the Roundtable on Sustainable Palm Oil (RSPO) certified physical supply chains. Twelve of our manufacturing sites are now RSPO supply chain certified to handle Certified Sustainable Palm Oil (CSPO) based raw materials, allowing us to provide our customers with certified products.

By the end of 2016, over 440 products that support CSPO were available; enabling us to supply more than 3,500 customer product combinations of CSPO derivatives, covering all geographical regions and all nine business areas; as a result we have seen a 63% increase in CSPO sales volumes compared to 2015.

Case study

A consumer and customer driven approach to Sustainable Palm Oil

Our extensive work on CSPO has been part of our response to the year on year growth in consumer pressure to support Sustainable Palm Oil (SPO).

Our calculations suggest that industries delivering consumer goods, which include home care and personal care products, consume around 5% of the world palm output. This is largely as derivatives, as they are key ingredients to the essential composition of these products; around 70% of cosmetics contain palm derived raw materials. Since we produce the widest range of personal care ingredients in the world, clearly it is our responsibility to help drive industry transformation to CSPO derivatives.

In August 2015, The Consumer Goods Forum issued Sustainable Palm Sourcing Guidelines with recommendations including RSPO certification of supply chains, and palm oil sourcing policies that seek transparency and support the production of deforestation-free sustainable palm oil. Importantly, consumer goods companies are encouraged to disclose time bound company policies, implementation plans, goals and demonstrate progress that supports deforestation-free and sustainable palm oil in their individual supply chains. At Croda, we are already well advanced in meeting these demands, which has been widely recognised by our peers.



RSPO members play a fundamental role in driving transformation to source and deliver physical certified sustainable palm oil products. With continued commitment and engagement with suppliers, clients and industry bodies around the world, in 2016 Croda has been an example of commitment in driving change and effectively overcoming many of the obstacles and successfully influencing others in the supply chain to become sustainable. Once again, the RSPO highly commends the industry leading efforts made by Croda during this year and the tangible results achieved by the company in their journey towards making Certified Sustainable Palm Oil the norm."

Datuk Darrel Webber
Chief Executive Officer
RSPO



Croda provides a high level of support and industry expertise with detailed information on the use of palm derivatives in personal care ingredients."

Jonathan Gorman
Tesco Responsible Sourcing Management
(Forests and Seafood)

Case study

Winner of Johnson & Johnson Supplier Enabled Sustainability Award

Johnson & Johnson (J&J) acknowledged our exceptional contribution to their global sustainability ambitions across their global, direct and indirect supplier base. On receiving the Award Chris Sayner, Vice President of Customer Alliances, Croda said:



By winning the Supplier Enabled Sustainability Award, we are honoured that J&J has recognised our contribution to their leading sustainability programme. When they presented it to us they highlighted our commitment to innovation and our aligned sustainability business plans, particularly our supply of RSPO certified ingredients, embedding sustainability in new product development, joint supply chain social projects and our commitment to pilot their supply chain transparency programme."

Chris Sayner
Vice President of Customer Alliances
Croda

Supply chain traceability and transparency

In 2016, by working with our key suppliers in all regions, we continued to make progress against our target to implement a system that will facilitate the traceability of palm derived raw materials by the end of 2017. Transparency is the first step to gaining full traceability; to this end we engaged in face to face meetings with, and sent out an online questionnaire to, suppliers from whom we source 80% of our palm derivative volumes. We received a 100% response to the questionnaire and found the following:

- 50% of our 2016 global volumes for palm oil derivatives and palm kernel derivatives have supplier transparency back to mill/refinery and mills respectively
- 56% of suppliers confirmed their public commitments against deforestation
- 32% of our suppliers publicly report their greenhouse gas (GHG) emissions
- 40% of our suppliers confirmed programmes to support smallholders.

These are positive findings and during 2017 we will continue to work closely with our suppliers on transparency and traceability with the aim of total elimination of deforestation in our palm derivative supply chains.

We work hard to ensure that the social and ethical sustainability of our supply chain reaches much wider than CSPO, so in 2016 we also began our partnership with Sedex (Supplier Ethical Data Exchange). This involved asking 200 of our suppliers, based on their geographical location and raw material origin, to register with Sedex and complete their questionnaire, achieving a 70% completion rate. We have now started to risk assess the responses and will be working alongside our newly formed Corporate Ethics Committee to agree next steps on this ongoing programme.

Case study

EcoVadis Gold Status for the third year running

EcoVadis's assessment methodology, which rates more than 20,000 companies, looks at environmental, labour, fair business and sustainable procurement practices. It is an increasingly important tool for customers across many industries to rate the sustainability credentials of suppliers. At Croda, we use EcoVadis as an external reference for continual improvement, achieving Gold Status with our first filing three years ago; we have increased our score by 15 points to 77 through the steps we have made across their assessment criteria. In 2016 this has seen us placed not only in the top 1% of all chemical companies assessed by EcoVadis, but the top 1% of all companies assessed overall.



High praise from Organic Monitor

Held in Paris during October 2016, Organic Monitor's third annual Sustainable Beauty Awards recognised businesses that continue to push boundaries for sustainability in beauty and personal care. We were delighted to be awarded the runner-up prize for Sustainability Leadership, acknowledging our commitment to renewable raw material sourcing and embedment of the 12 Principles of Green Chemistry into global R&D.

Case study

Ensuring sufficient benefit at every point of the supply chain

The Nagoya Protocol on Access and Benefit Sharing, which states that every party involved in each step of the making of goods should gain sufficient benefit from the value of the end product, is particularly relevant to a number of our long and complex supply chains.

We have taken a very proactive approach around the world in helping governments and regulatory bodies to understand our industry in order to aid the development of legislation and sector guidance. Most notable, in 2016, has been our work with the European Commission to finalise their guidance for all European Union countries to ensure industry compliance.

Innovation every day

Preventing contamination

We have specialist technologies that ensure crop treatments are delivered directly to the target surface, which reduces the amount of product used and prevents the contamination of land and waterways through drift and overspray.

Reduce environmental impact

Our seed coatings decrease the amount of dust generated at the time of sowing. This reduces waste and impact on the surrounding environment and wildlife.

Improved taste

Our high purity excipients improve the taste of children's medicines, making them more palatable to take.

Enabling new medicines

Our high purity excipients are enabling new and complex treatments for oncology to be brought to market as they help to stabilise and deliver these life-changing drugs.

Minimising product use

Our seed enhancement treatments directly protect seeds from pests, reducing the need for farmers to use additional products on their crops.

Planet and Process

Minimising the impact of our manufacturing processes

Our sustainable product story is aligned with our focus on the impacts of our operations on people, planet and profit.

The impacts can be intrinsic to the product, referring to its renewable raw material content and route of manufacture; or extrinsic, referring to the ways in which our products are used and their biodegradability as they are disposed of. Our aim is to minimise any negative environmental impacts and maximise the positive ones.

A key measurement of our progress in this area is on reducing our impact on a fragile world, which has been a major focal point in 2016 as we obtained verification of our energy and greenhouse gas (GHG) data in

accordance with ISO 14064-3. At the same time we have broadened our scope of GHG measurement to include all of our business locations in addition to our manufacturing sites, and now include tracking of our refrigerant inventories, although only small, to gauge any losses of these potent GHGs. Our multiyear energy and carbon strategy has passed another major milestone with the commissioning of a large bio-gas energy system at our manufacturing site at Gouda in the Netherlands. This is an integrated bio-refinery and uses by-product materials to generate energy, just one example of how our teams around the world are working hard to continually improve the efficiency of all our operations in a safe environment, whilst ensuring customer satisfaction and consumer safety.

Key Material Areas



Environmental Impact
Minimise the impact of our operations



Process Safety
Keeping our manufacturing sites safe and legally compliant



Quality Assurance
Contribute to, and proactively seek, higher quality standards across product and operational aspects of our Business to ensure consumer safety

Highlights

Externally Verified

Group scope 1, 2 and 3 GHG emissions by Carbon Smart p15

9.5%

reduction in Group water consumption compared to 2015 p16

3.2%

reduction in scope 1 and scope 2 GHG emissions compared to 2015 p15

10.4%

reduction in energy intensity compared to 2015 p16

2.5%

reduction in Group waste to landfill compared to 2015 p16

90%+

of the packaging we use is fully recyclable p16

Reducing land impact

At the end of 2016 we were on schedule to achieve a 10% reduction in Group waste to landfill by the end of 2020, having achieved a 2.5% reduction compared to our 2015 baseline year. Since 2010 we have seen a 57.8% reduction with up to eight of our sites sending zero waste to landfill per annum. Two of our manufacturing sites have made a notable contribution to this achievement: Gouda, in the Netherlands and Mill Hall in North America, both of which have reduced annual landfill waste flows in recent years, particularly in 2016, from thousands to tens of tonnes.

Waste to landfill (Te)

2016	2,053
2015	2,106
2014	2,670
2013	2,853
2012	2,419
2011	2,779
2010	4,870

Reducing our reliance on fossil fuels

During 2016 we have focused on delivering major environmental project improvement plans at a number of our manufacturing sites, and invested in the verification of our systems for greenhouse gas (GHG) emissions measurement and reporting.

Achieving the objectives set out at COP21 is thought to require a 50% reduction in carbon emissions by 2050 across the chemical industry and that means finding viable alternatives to burning fossil fuels. In 2016 our total scope 1 and 2 GHG emissions* were 195,900 Te CO₂e, compared to emissions of 202,219 Te CO₂e in 2015. Our 2016 scope 1 emissions were 128,550 Te CO₂e, compared to 130,492 in 2015.

During 2016, as part of the process to externally verify Group carbon data, we identified some systematic changes that had to be made to our fossil fuel methodology calculation. This has meant that the target we set in 2016 to reach a non-fossil fuel energy level of 30% by 2020 has now been rebased to 27%. We began our journey towards this new target in 2016 with a performance of 21.3%.

Non-fossil fuel consumption (%) (rebased)

Year	Percentage
2016	21.3%
2015	20.5%
2014	22.5%
2013	20.9%
2012	9.5%
2011	9.8%

The rebasing of our non-fossil energy target and performance figures does not affect the challenge we have set ourselves; the magnitude of the targeted improvement remains the same. Every manufacturing site has developed a strategy for energy efficiency improvement for the next four years, all contributing to our overall target, and we will continue to take opportunities to invest in projects designed to deliver these strategies.

At the end of the verification process, carried out by Carbon Smart, we were very pleased to receive limited verification of our scope 1, 2 and 3 emissions for 2015, our baseline year and also for 2016. Carbon Smart were complimentary about our practices and the recommendations they made for the improvement of our systems have now been incorporated into our reporting procedures.

In addition, we have expanded the breadth of what we measure as part of our reporting of scope 1 GHG emissions to include the fuel we burn in our company vehicles and minor losses of refrigerants. In 2016 we made an inventory of all obsolete, or soon to be obsolete refrigerants, and established a protocol for our manufacturing sites to track them and calculate the potential fugitive releases of these potent greenhouse gases.

Changes in GHG emissions (Te CO₂e)**

Year	Scope 1	Scope 2
2016*	128,550	67,350
2015*	130,492	71,727

Independent verification statement by Carbon Smart†

Croda International Plc's reported scope 1, 2 and 3 GHG emissions have received limited verification in accordance with the requirements of the ISO 14064-3 standard. The verification covers emissions from the reporting years ending 31 December 2015 and 31 December 2016.

Our verification opinion

Based on the verification assessment, we have found no evidence to suggest that the GHG emissions assertion of Croda International Plc's scope 1, 2 and 3 emissions are not:

- prepared in accordance with Croda International Plc's relevant internal GHG emissions reporting methodologies
- materially correct and a fair representation of their GHG emissions.

† The formal Independent Verification Statement by Carbon Smart is available at www.croda.com/carbonverification

Making good progress in scope 2 and 3

We continue to make year on year progress on scope 2 GHG emissions*, which reduced from 71,727 Te CO₂e in 2015 to 67,350 Te CO₂e in 2016. The 6.1% improvement was largely due to a new bio-gas engine at our Gouda manufacturing site in the Netherlands being brought online, coupled with continued good performance of our landfill gas combined heat and power plant at Atlas Point in North America.

The new bio-gas facility at our Gouda site has significantly reduced our reliance on electricity supplied from the Dutch grid,

a significant proportion of which is produced from burning fossil fuels. The novel facility attracts tax credits and subsidies from the Dutch Government and, having been part financed by the European Union, is recognised as a best-in-class demonstration project.

For the first time since its commissioning in 2008, our wind turbine at our Hull manufacturing site in the UK was out of operation for five months for maintenance during 2016. This had an impact on the amount of fossil fuel we consumed as we had to import electricity from the UK national grid. However, our Chocques manufacturing site in France continues to boast one of the Group's lowest GHG emissions despite its considerable capacity. This is due to the fact that energy for the site is drawn from the French national grid, which is largely nuclear, and the steam used on site is drawn from a local incinerator that burns municipal waste of largely non-fossil origin. Our Cikarang manufacturing site in Indonesia has also made a contribution to reducing our scope 2 emissions by converting its steam raising boiler from light fuel oil to natural gas, whilst in Singapore a full energy audit last year has identified seven areas for improvement that we are now looking to implement.

For the first time, in 2016 we have produced a detailed report of our scope 3 GHG emissions, which describes our impact in each of the 15 categories of emissions. This work has also been externally verified. An agenda is now being pursued to progressively improve the quality of the report by employing a hybrid calculation method that uses suppliers' data in conjunction with published emission statistics. It is intended that this technique will identify areas for further focus and improvement. Using the superior new method, our scope 3 GHG emissions are calculated to be 596,330 Te CO₂e in 2016 compared to 583,140 Te CO₂e in 2015.

* Our 2016 external verification of our scope 1, 2 and 3 GHG emissions identified systematic changes to be made to our fossil fuel calculations. Our 2015 and 2016 scope 1 and 2 data has been re-calculated to ensure the most accurate measurement methods and greatest transparency.

** Scope 1 emissions are calculated using the International Energy Agency's published conversion factors for the tonne equivalents of CO₂. Scope 2 emissions are determined using the country emission factors for electricity generation published by the International Energy Agency.

Renewable raw materials in scope 3

The impact on our operations of using mainly renewable raw materials is very significant.

Although not fully accounted for in the scope 3 emissions total for 2016, it is clear that the CO₂ fixed from the atmosphere during photosynthesis, and included in our plant based raw materials, is a major mitigation against the GHG emitted by our other operations. In 2016, 62% of our raw materials were from renewable sources.

More ways to minimise our negative environmental impact

In other areas of our commitment to reducing the impact of our operations, we are on schedule to achieve a 10% Group wide reduction of waste to landfill by 2020 having already made a 2.5% reduction in 2016, which we hope to maintain and further improve upon in 2017. With up to eight of our sites sending zero waste to landfill per annum, two other manufacturing sites are notably contributing to our good performance against this target. One of these is our largest site, Gouda in the Netherlands, and the other is Mill Hall in North America, which have both seen significant reductions from thousands to tens of tonnes of waste being sent to landfill in recent years, particularly during the reporting year.

A challenging Group target, against which we are taking positive steps, is to reduce total Group water withdrawal by 10% by the end of 2020, where we saw a 9.5% reduction in 2016 compared to 2015. The biggest change in 2016 was at our Shiga manufacturing site in Japan, where investment to reduce water usage led to a reduction of 2% of total Group water consumption. Another success story is at our Mevisa manufacturing site in Spain, which is our only site to operate in a water-stressed region. Here, from 2012 to 2016 overall water usage has fallen from 1.24 to 0.87 million cubic metres, even though plant output has increased in the same period, which has been brought about by investment in improved cooling infrastructure and water recycling.

Energy intensity

In 2016, we set ourselves a new Group target to reduce total energy intensity by 5% by the end of 2020. Our chosen measure of energy intensity is energy consumption divided by 'value added', where value added is defined as operating profit before depreciation and employee costs*.

In 2016 our energy intensity was 6394 GJ per £million, a fall of 10.4% from the 2015 figure of 7135 GJ per £million.

* Expressed in constant currency terms

With further expansion plans in the pipeline, a new plan has been developed to reduce water usage further, which will involve additional water recycle loops in the cooling systems and treatment and recycling of water from the site's effluent stream. This will be the final step in the water consumption reduction journey of the site and we expect to see a positive impact on the Group target by the end of 2017.

Water consumption (m³)

2016	7,600,958
2015	8,398,207
2014	7,827,876
2013	7,712,361
2012	7,964,806
2011	8,343,097

During 2016 we verified that our reported volatile organic compounds (VOCs), typically small quantities of ethanol and isopropyl alcohol vapour, have very little impact on our GHG emissions. We will keep VOC reduction as a target, however, it will now be driven by economic and housekeeping factors rather than climate change. One new area that we have started to focus on is the recyclability of product packaging. Our initial survey of the materials we currently use reveals that above 90% are fully recyclable. The exceptions have been identified and we are investigating options to replace these.

Case study

Successful reduction of GHG emissions at Atlas Point

Much of the work constructing our bio-ethylene oxide (bio-EO) plant at our manufacturing site at Atlas Point, North America, which will be the first bio-EO plant in the USA, was completed during 2016. When production comes on line in late 2017 we will see the following benefits:

Reduced reliance on petrochemicals

Instead of using ethylene oxide (EO) derived from petrochemical sources, the plant will use 100% renewable bioethanol derived from natural feedstocks, thereby displacing the use of petrochemical naphtha and natural gas as raw materials in the manufacture of high value EO derivatives. This includes our bio-based ECO range of surfactants, which will be launched when the plant is commissioned in 2017. Atlas Point already boasts a low reliance on fossil fuels as a significant proportion of the energy used on site is renewable energy from landfill gas supplied by a dedicated pipeline from a municipal facility approximately 3.5 miles away, as well as electricity generated by an on site solar array.

Lower carbon footprint

The Atlas Point site will be able to accept bioethanol from different natural feedstocks, all of which contain only carbon obtained from the atmosphere by photosynthesis. Products made using EO derived in this way have a lower carbon footprint than petrochemically derived products.

Increased safety

Although EO in North America has been safely transported by rail for many years, moving this material in such a way still presents a level of risk, especially as it moves through a number of populated areas on its way from the Gulf of Mexico. As the EO will be made at our Atlas Point site, the need for transportation is eliminated with the additional benefit of reducing the scope 3 GHG emissions associated with its transport.



Effluent compliance becomes business as usual

In 2016 we took the decision not to continue with effluent discharge compliance as a public target.

This is because we have achieved high levels of compliance for some time and the multiyear global improvement programme led by our operations teams is now complete. The improvements have been integrated into our normal operating procedures and are now proven to be sustainable. Internal monitoring continues to maintain tight control of our effluent treatment plants.

CDP reporting

We are fully committed to minimising our impacts on the environment; our transparent disclosure of data against all four of the CDP programmes is illustrative of this.

In 2016 we received A- for our Forest Report on the topic of palm oil, against a programme average of B. We maintained our B management rating for our supply chain water disclosure report, against a programme average of D, and we achieved a climate change disclosure rating of B against a programme average of C and our supply chain climate change score was B versus an average of D.



Keeping our processes safe

Our Process Safety Management programme underpins the sustainability of our Business. Our licence to operate depends on it and our Business could be seriously damaged by a major process incident. We operate high hazard processes at several sites and recognise that a great deal of effort is required to maintain the scrutiny and attention to detail that is required to keep our processes safe. Our approach includes a regular review of all 192 of our processes by our own specialist process engineers, whom we train in our own Hazard Study Leaders' Academy.

During 2016 we had no noteworthy process safety incidents across our Business. We are vigilant at tracking all incidents and near misses, no matter how minor, and we investigate them to establish the root causes and assign preventive actions, in the knowledge that this attention to detail will help to prevent larger incidents from happening. In our reporting of near misses, during 2016 we had an internal target to reduce the number of occasions when systems to prevent or protect plant operations from overpressure were activated. Over the year, a reduction of 14% was delivered as a result of the engineering and procedural improvements made.

In addition to the changes we make through incident and near miss root cause analysis, we proactively identify improvements using our Process Risk Review (PRR) system and invest whenever effective opportunities are identified to reduce overall risk. In 2016 our well established Hazard Study Leaders Academy saw five of our process safety specialists complete their first full year of a two year programme and a further five starting the programme. At the end of the course they will all be awarded a Post Graduate Certificate in Leading Process Safety Hazard Studies by the University of Derby. These individuals, along with their colleagues across our manufacturing sites, were instrumental in ensuring that by the end of 2016 we had successfully met our target to embed our Process Safety Management System at all of our manufacturing sites. In achieving this, we have reviewed all of our Basis of Safety documents to ensure compliance with our internal standards and implemented amendments as required. We are also

progressing well against our wider reaching target to ensure that all 192 PRRs, of which Basis of Safety documents are a part, are compliant with our internal quality targets by the end of 2018.

Within the framework of PRRs and specifically those that concern our high hazard processes, in 2015 we committed to an external peer review to seek feedback; during 2016 we completed this for our priority processes. Some areas for improvement were highlighted, which we have already actioned, such as upgrades to plant emergency shutdown systems. We have also agreed a protocol for completing the remaining peer reviews of our high hazard processes before 2020.

Case study

Quality management is the key to customer satisfaction

As a sales and service organisation, our German office and warehouse has focused on meeting our customer's specific needs, which includes special delivery instructions.

For example, using specific pallets and labelling in our warehouse allows them to meet one of our customers' particular stringent requirements to facilitate a more efficient process of accepting our products.

Our quality management system forms an integral part of managing these special customer needs. Using the Plan-Do-Check-Act cycle we make sure that we understand our customer needs, implement ways of working, which includes training our people and then monitoring our performance, always seeking ways to continuously improve. This strength allows us to gain new business, safeguards our reputation, and ensures that we provide an outstanding and individual service to our customers.



Safeguarding customer satisfaction as well as our people and operations

We are very aware of the vital role that our quality assurance systems play in our Business and recognise it as a Material Area in our sustainability programme, which differentiates us from many of our peers. We understand that it is the foundation for consistency and improvement in everything we do. 'Getting it right first time' minimises waste and reduces our impact on the environment; ensuring that we are operating efficiently and effectively at all times is crucial to safeguarding customer satisfaction and our continued business success.

In 2016 we met our certification target to bring newly acquired manufacturing sites in line with our globally applied standards. This means that all sites purchased more than three years ago now have OHSAS 18001 certification, as part of our drive to meet occupational health and safety management best practice. They all also have ISO 14001:2004, an environmental management system certification and ISO 9001:2000, a quality management system certification. We will continue to apply these standards to new acquisitions, where appropriate, including recently acquired Incotec and Inventiva.

We are also now seeking to include our major sales and distribution centres in an aspect of this target by requiring them to attain ISO 9001:2000 by the end of 2018. Our intimate knowledge of customer requirements tells us that these centres are a crucial part of delivering customer satisfaction, which makes quality management systems vital in their operation. We do not intend to put very small operations through the certification process, but will be providing access to regional quality experts to facilitate the sharing of best practice.

Underpinning these standards is the Croda Quality Manual, which is now implemented at all of our offices and manufacturing sites. In 2016 we conducted a gap analysis to ensure complete compliance with the manual and going forward spot checks will form part of our annual quality audit programme.

Case study

An integrated bio-based factory, or 'bio-refinery'

Five years ago, a team at our Gouda manufacturing site in the Netherlands embarked on an ambitious programme to reduce local and global environmental impact by identifying ways to integrate production, by-product streams and energy generation, all whilst improving profitability.

The focus was on energy efficiency, water use and a reduction in greenhouse gas emissions (GHGs). The site already has an inbuilt advantage over many of its peers in that most of its raw materials are renewable. A good example of this is rapeseed oil, grown in Europe capturing carbon dioxide (CO₂) from the atmosphere by photosynthesis. Even after allowing for harvesting, crushing and transportation of the rapeseed oil, the raw material still has a net negative contribution of GHGs as it enters the sites gate: typically -1.5 Tc of CO_{2e} per tonne of rapeseed oil delivered.

As the rapeseed oil moves through the manufacturing process, water and energy are required to convert it into products such as polymers and lubricants. Several processing steps are typically used, but the first one of them where the rapeseed oil is split into its component parts generates dilute, crude glycerine or 'sweet water' as a by-product. The traditional outlet for this by-product was to evaporate off the 90% water it contained and refine it to a pure glycerine product, which is an energy intensive process. At Gouda, we have developed a bio-fermenter to transform this crude glycerine into methane, which we burn in a boiler to raise steam and generate electricity in a gas engine, which also recovers the heat it generates by further steam generation. The 2 MW output of the generator reduces the import of electricity from the grid, avoiding CO₂ emissions from

external power generation thanks to the green electricity we produce from bio raw materials. A further benefit of this novel use of the crude glycerine for energy production is that there is no longer a need to transport concentrated crude glycerine from Gouda for refining elsewhere in Europe, which also eliminates the need to package the refined glycerine and the associated warehousing and distribution activities. This all results in a considerable saving in GHG emissions accrued from the reduction in these ancillary activities.

Gouda's green philosophy extends beyond energy and GHG saving to include water, where in 2016 a project saw the installation of a plant that recycles waste water for treatment with a reverse osmosis purifier for reuse as boiler feed water. This had a major knock-on effect in that it also dramatically reduced the use of water treatment chemicals, which have a high carbon footprint. The project overall has the potential to reduce water abstraction from the local aquifer by up to 1 million cubic metres per year.

The Gouda site is positioned close to the city centre and, as well as being a major employer in the area, is mindful of the proximity of its operations to the local residents. The site embraces this responsibility by investing in being a good neighbour to the city with a bi-annual open day for residents and families of employees at the site. During the day, visitors learn about the very rigorous programmes of process safety and environmental controls that are in place and understand more about the products that are being made. There are also regular community liaison meetings throughout the year and, in 2016, over 389 hours of 1% Club engagement were recorded where employees had volunteered to support a variety of different local good causes.



Innovation
every day

Effective cleaning

Our ingredients provide effective cleaning performance, enabling highly concentrated formulations and increased bio-based products. This can lead to lower water usage and less packaging, which reduces demands on transportation.

Durability

Our speciality lubricant and fuel components reduce friction and wear throughout the car, leading to lower fuel consumption, lower emissions and improved vehicle life.

Eliminating solvents

Our ingredients for water-based coatings help protect paintwork from stone chipping and UV damage. This increases the longevity of the paint and car bodywork, whilst allowing solvents to be replaced with water, delivering environmental and health benefits when applying the coatings.

Performance enhancement

Our ingredients enable engineering plastics to be modified to improve their endurance to friction, flexing, temperature and grease in applications where the plastics are used to protect critical components such as constant velocity joints and air ducts, thus prolonging their life.

Improve fuel economy

Our polymer additives are used to improve the processing and performance of plastics for automotive components by reducing cycle time and improving scratch resistance. They also enable light weight plastics to be used as substitutes for traditional materials to help improve fuel economy.

People and Community

Ensuring the success and safety of our people and supporting the communities in which we operate

People underpin everything we do and are the focus of our Business.

From the design of our products, to the safe and sensitive impact of our operations on the surrounding environment and community, it is our employees who have made us the sustainability leader we are and will continue to be. We work hard to invest in everyone at every level of our Business to help them achieve their best, whilst creating a safe and supportive place for them to embrace the many opportunities we offer.

We are proud of our people's personal and professional achievements, both within the Croda family and in the wider world as they represent us in industry and through their volunteering work in our local communities.

People are the focus of five of our 10 Material Areas. This ensures that we continue to develop new programmes and methods for our employees to progress their careers, to achieve their ambitions and at the same time encourage knowledge sharing for long term business benefit.

As a global business we realise the importance of understanding and embracing differences within the countries in which we operate, whilst ensuring that our core values are aligned. In 2016 we have begun work on a global employee survey that will help us gain a deeper understanding of our own Croda culture as we strive to sustain an environment where our talented and dedicated people can flourish in a way that differentiates our Business.

Key Material Areas



Occupational Health & Safety

Empower employees to have health and safety at the forefront of their thinking



Our People

Create an environment where people can thrive



Diversity & Inclusion

Embrace and empower all individuals



Knowledge Management

Safeguard our knowledge and expertise



Community Education & Involvement

Support the communities in which we operate, with a primary focus on encouraging young people to work within science and technology

Highlights

102,000+

training hours were recorded by 86.7% of employees [p22](#)

83.5%

of UK employees and 57% of those overseas invest in one of our sharesave schemes [p22](#)

3,157

hours were spent on education initiatives, almost half of our volunteering time [p24](#)

Training

on knowledge management is now embedded in our programmes for leaders, managers and specialists [p24](#)

OSHA

reporting has been embedded to enable us to benchmark against multinational organisations [p21](#)

195+

is the number of trade associations and industry bodies that our people are active in [p22](#)

A focus on knowledge management

The development and retention of knowledge is critical to our future success. Through our talent development process we have identified key knowledge risk areas with an action to mitigate these. As the role of line manager is fundamental in supporting such activities, we have implemented a training module in our Management Essentials Programme, which will also be included in our Specialists Development Programme, we are also raising awareness of this skill set through bespoke manager coaching and development. We have always had a focus on training across our Business and are very proud that we are able to deliver targeted events across the world year on year.

Employees receiving training (%)

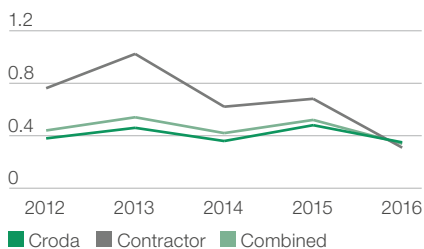
2016	86.2%
2015	91.2%
2014	91.2%
2013	90.0%
2012	85.0%

Empowering our employees to stay safe and healthy

As well as investing significant time and resources into Process Safety in order to reduce risk, we are also working hard to continually improve personal safety across the whole organisation, with an aspirational goal of zero harm.

A key indicator of occupational safety has been the lost time injury (LTI) rate of one day or more, which we track for our employees, contractors and the two combined. This rate expresses the number of injuries per 200,000 hours worked where we saw a reduction in the LTI rates for both employees and contractors in 2016. The employee LTI rate fell by 27%, whilst the contractor rate fell by 54%. These figures, along with those dating back to 2012, now reflect our performance following a transition to Occupational Safety and Health Administration (OSHA) reporting, which we did as it is used by most multinational companies, thereby facilitating comparison.

Lost time injury rate (per 200,000 hours worked)



The cornerstone of our drive to improve occupational safety is our new Behavioural Safety Observation System which, in line with our target, we deployed across all our manufacturing sites in 2016, except for our recently acquired Incotec and Inventiva operations as their health and safety systems are currently under review following an internal audit. To complement this work, we also implemented a two year Supervisory Competence Training programme following the completion of a successful pilot project at our

manufacturing site at Rawcliffe Bridge in the UK. At higher levels in the Business, we defined safety critical behaviours for Site Directors and other senior operational roles to assist them in their setting of standards and personal development.

Case study

Site safety week in Singapore

In November 2016, our manufacturing site in Singapore held a Site Safety Week to coincide with hosting the Asia Regional Safety Health and Environment (SHE) Managers' meeting.

In addition to delivering specialist training on a variety of subjects, employees and contractors were encouraged to participate in a series of activities designed to promote different aspects of managing safety. Management teams of contractors were also invited to participate, with the opportunity taken to recognise good contributions in managing safety performance.



We are always seeking to improve how we manage personal risk and last year at Le Perray, our Sederma operation in France, this included training eight employees in the Behavioural Safety Observation System and selecting a series of tasks to be observed based upon their evaluation of risk and hazard. As part of this, manual handling and ergonomics were identified as early priority areas for study. There is now a rolling programme of observations, with results fed back immediately to the employees involved and with the general findings communicated across the site. A variety of communication media is used to ensure that all people are made aware of performance and any issues arising, ranging from booklets and posters to emailed information alerts.

Following an arm injury that occurred at our warehouse in South Africa in late 2015, additional assessments of our SHE management systems were conducted at all of our non-manufacturing sites. This resulted in training in SHE management systems being delivered during 2016 to members of management teams at these sites around the world. This demonstrates our longstanding commitment to learn from our experiences and to widen that learning across our Business.

A culture of career development

Attracting, developing and retaining talent is crucial to our future success and this is reflected in three of our Material Areas: Our People, Knowledge Management and Diversity and Inclusion. Integral to this is the Croda culture, as outlined in our corporate vision. We want our people to feel empowered and recognised for their commitment, creativity and innovation; each individual should be treated fairly and equally, with openness and transparency; and we strive to create a 'fun' and informal environment with dynamic, agile, collaborative ways of working. We believe that the Croda culture is positively different to that of our competitors and is key for the continued success and high performance of our people and our Business.

In 2016 we focused on developing a more in-depth understanding of our culture at every level and location. For example, we carried out a targeted survey to assess how engaged our operations in Asia feel. We also implemented our Straight Talk listening groups to develop a deeper understanding of our culture as it really is, across the Croda family. We will be undertaking a global survey in the first quarter of 2017 to understand the breadth and depth of any cultural differences. In the longer term, we will follow this up with further listening groups and seek to incorporate our culture into our recruitment strategy.

Investing in people at every level

Our success depends on our people at all levels of our Business and so we have done much to invest in our 'culture of development' and to reinforce, at every level, the need to 'pass on what you know'. This includes:

- **Senior Executive Coaching Programme**, which is focused on ensuring that our leaders have effective coaching and mentoring skills to develop our future leaders. The programme has been delivered to all Executive Committee members, and the European Regional Operations Board and will now be widened out to other functions.
- **Management Capability Programme**, which is designed to ensure that all of our people managers are fully equipped to define individual employee objectives and align them with our business strategy, whilst embedding an equal and diverse approach. We have rolled out the programme's performance management module globally and additional modules are in progress, including those on coaching skills for managers, diversity and inclusion and cultural awareness.
- **Specialists Development Programme**, which is specifically for our many business specialists, from chemists and engineers to financial and human resources. Their knowledge is critical to our continued success, hence a keen focus throughout on knowledge transfer. The programme has been developed and will be launched to the Business in March 2017.

In 2016 our existing Management Essentials Programme was updated to include a section on safety, health and environment (SHE) responsibilities as a manager, which was delivered in the Communication Skills module, along with a greater focus on knowledge management within the Developing People module. Our Leadership Development Group completed two of their four training modules, one of which has an increased focus on the challenges our industry and Business faces in the area of diversity.

Acting on feedback from our graduates

Graduates are an important part of our talent pipeline and we invest in them through our Graduate Programmes, which continue to evolve based on feedback to ensure that the experience is as rewarding as possible.

For instance, during 2016, in response to feedback from our engineering graduates, we extended our placements from nine to 12 months to ensure the maximum opportunity for knowledge and skills development.

All of this work is tied into our Croda Aspire appraisal scheme, which aims for everyone to have a formal annual appraisal by the end of 2017. In 2016, we have seen more global buy-in to this process; it is now active in all but two of our locations. A review of appraisals as the 2016 period drew to a close has seen 82.7% of employees participate. The global roll out of the scheme has seen us translate both on and off line materials into six different languages to enable greater transparency and attention on strategic priorities and targeted development.

Training at every level

During 2016 over 102,000 training hours were recorded by 86.7% of our global workforce.

In support of tailored career progression at every level is our global Learning Management System (LMS), which was implemented in 2015 and in 2016 expanded its usage and reach. The LMS provides a number of mandatory and optional online training modules, from manual handling and product based training, to office safety and competition law, which can be selected by the individual or line manager.

Contributing to industry debates

Our experts from a number of disciplines across our Business represent us at over 195 trade associations and industry bodies.

Supporting our industry in this way helps to develop our people and futureproof our Business.

Case study

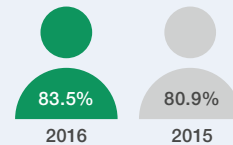
Creating even closer links with our people

Our sharesave schemes give all our employees an opportunity to invest in our future and is an excellent tool for employee retention.

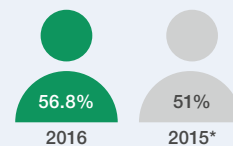
The percentage of UK employees investing in 2016 was 83.5%, with a non-UK figure of 56.8%. This is an increase of 3.5% and 5% respectively, which shows that this is an increasingly valued employee benefit.

Sharesave members

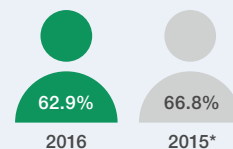
UK employees participating in a sharesave scheme (%)



Overseas employees participating in a sharesave scheme (%)



Total number of employees participating in a sharesave scheme (%)



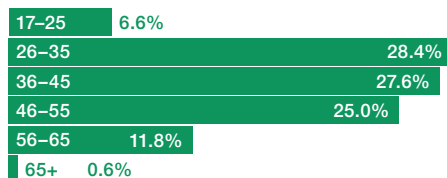
* Not including Incotec, who were acquired after the sharesave scheme for 2015 had closed

A diverse workforce and an inclusive approach

'Culture' not only applies to our corporate culture, but also to the different cultures in which we operate and that our workforce represents. The business case for diversity and inclusion links directly to our Business aims of innovation and sustainability.

Now that our target to ensure that all of our operations have appropriate diversity and inclusion activities and the right policies in place has been met, our intention is to now focus more on the right activities to ingrain diversity and inclusion within our Business, which we will achieve by creating a programme of actions, targets and events from 2017 onwards. This includes, at the beginning of 2017, launching a special dates calendar to ensure that our people can appropriately embrace and celebrate key cultural and religious dates. We will also be taking a deeper look into our recruitment process to encourage balanced recruitment shortlists and ensure that we attract the widest possible pool of talent.

Age of employees across the Group (%)



Full time and part time employee split across the Group (%)



Gender split across the Group (%)



While we continually seek to improve, we have some excellent examples of how we are focusing on specific needs globally and locally. For instance, for the last two years we have run our talent process on a global market, function and regional basis, which has helped us to look at employees from across the globe in the same forum.

This has resulted in a more inclusive system and diverse talent pool, helping us to identify the best candidates for development programmes, secondments and internal moves.

Between 2013 to 2016, our 2020 Network development programme, which is designed for our aspiring leaders, has brought together 128 employees representing all five of our regions, creating connections that have continued beyond the end of the course and live within the Business.



Group of 2016 2020 Network Graduates

On a regional basis:

- Croda global headquarters in the UK and two operations in Singapore have led the way in flexible working arrangements that enable employees to balance work and family commitments
- India has introduced flexible bank holidays to allow all to celebrate their chosen festivals and religious days
- The UK has matched the shared parental leave policy with the maternity policy, allowing partners of expectant mothers to enjoy the same benefits
- Croda Brazil hired two employees as part of a social inclusion programme where minors are introduced to the Business by a special job contract, enabling them to learn basic tasks in finance, human resources and production areas on a part time basis
- Our UK and North American manufacturing sites have female operators and now both Gouda in the Netherlands and Mevisa in Spain have hired their first female operators with plans to recruit more by the end of 2017.

Case study

Enhancing the Croda website experience

In 2016 we completed a project to redevelop our corporate website. The new platform not only offers greater insight into who visits our website and the information they are seeking, it is also more accessible and user friendly for our global audience.

Specifically in the careers area we have invested in developing a section that fully represents all five of the regions in which we operate. It features a wide cross section of employee career journeys that offer inspirational people profiles to potential recruits. In 2017 we will look to develop more employee videos to add to those currently available from our Asia employees.



The importance of knowledge management

Our risk register identifies the failure to capture new knowledge and prevent the loss of existing knowledge as a business risk. The importance of knowledge management is now confirmed through its inclusion in every new manager's training via our Management Essentials Programme and Specialists Development Programme. Knowledge sharing is also a key competency in Croda Aspire, our appraisal scheme, remaining amongst the top five personal objectives set by managers, demonstrating that it is embedded at all levels.

In addition to ensuring that we have a culture that enables and encourages knowledge sharing, part of our talent development focuses on capturing knowledge from retirees through a comprehensive handover process. Our European operations team have encouraged short term secondments as an aid to knowledge transfer and looked at succession planning to identify where knowledge needs to be documented.

To facilitate the sharing of knowledge from a practical point of view, last year our graduates updated Croda Quick Connections. The result is a system that now profiles capabilities at all of our major operations, giving individuals clarity around what each part of the Business does and who to go to for more information.

Developing the workforce of tomorrow

As part of our commitment to the communities in which we operate, our Community Education and Involvement Material Area is centred on raising the profile of STEM (science, technology, engineering and maths) in local schools, colleges and universities. Actioned through our award winning 1% Club programme, which enables employees to donate 1% of their annual working time to support a wide range of good causes, this activity also supports the business objective of developing the future scientists we depend upon. The fact that 47.7% of volunteering hours in 2016 were for educational activities, compared to 24.5% in 2015, demonstrates the importance we, and our employees, place on STEM.

We have a dedicated STEM team based in the UK who, as well as appreciating the chance to get involved on a community level, are finding that the experience adds to their own professional development by providing them with opportunities to learn new skills, share different perspectives, network within and outside our business and develop communication skills.

Global STEM hours across the Group*

2016	3,157.0
2015	1,551.5

* Excluding Incotec and Inventiva

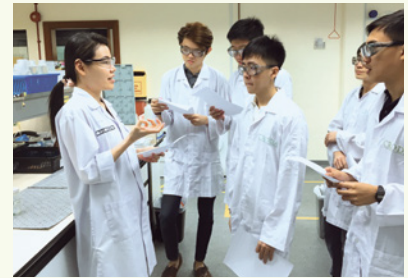
Case study

Industry mentors network in Singapore

In Singapore, our focus on STEM includes five of our employees volunteering as mentors to Ngee Ann Polytechnic, as part of the Industry Mentors' Network (IMN).

The aims of the IMN are to deepen students skills and commitment within their area of study, broaden their perspectives and help them to build valuable industry connections.

The employees participating were carefully selected from different departments based on experience and undertook our own mentoring training to help prepare them in reaching out to the students.



Case study

Developing our people through STEM

Our current UK STEM team leader, Sarah Hampson, has found that the experience has helped her to build time management skills and enabled her to collaborate with a wider cross section of colleagues.

Leading the team has given Sarah the opportunity to manage the objectives, budget and project team, all contributing to expanding her current skill set. During 2016, Sarah worked on developing the current STEM programme to include experiments for Key Stage 3, pupils aged 11 to 14 years. These have now been trialled and will be rolled out in 2017, assisting secondary schools to provide students insight into the application of science within business.

Reflecting on her time as the UK STEM team leader (2014/15), Clare Liptrot firmly believes that her experience has had a long term impact on her personal and professional development. As well as continuing to benefit from the sense of pride and communication challenges that engaging with children and teachers brings in her current STEM Ambassador role, Clare uses the networks she developed within Croda on a regular basis. It was by working within a diverse group in terms of professional expertise that Clare gained a greater understanding of other areas within Croda, which had the added advantage of helping her find better ways of doing things by looking at projects from different perspectives.



Sarah Hampson



Clare Liptrot

🔍 Case study

A global network of education ambassadors

In 2015, the UK STEM team established a global network of education ambassadors; a best practice forum to share information on STEM initiatives that over 150 employees signed up to. In 2016, 236 employees took part in STEM activities globally with a total of 3,157 hours spent on education initiatives.

🔍 Case study

Investing in STEM at Sipo, China

During the year the Croda Sipo STEM Ambassadors provided research and development training to two students from South West Science and Technical University, and conducted a site tour for 70 students with a focus on safety awareness and procedures, as well as production, plant and engineering.

Delivering tangible benefits to the local community

Recognising the responsibility we have to the local communities in which we operate is embedded across all our sites. We are committed to working with community organisations both proactively and reactively. This is evidenced by the 760 employees who contributed a total of 6,613 hours to community projects in 2016, equivalent to an in-kind donation of over £115,000. In addition to education, initiatives include assisting with blood donations, food donations, fund raising programmes and supporting other events such as World Environment Day.

Number of employees using 1% Club time across the Group*

2016	760
2015	798
2014	874
2013	777
2012	699

Total 1% Club hours across the Group*

2016	6,613.05
2015	6,321.00
2014	6,878.75
2013	4,386.60
2012	4,541.15

* Excluding Incotec and Inventiva

🔍 Case study

Croda Japan working with the local community

Our 1% Club activities can also help improve the local environment.

A team of eight volunteers from Croda Japan used a day of their volunteering time to join members of the local community in cleaning up rubbish strewn on the banks of Lake Biwa. As the largest freshwater lake in Japan, it is home to more than 50 species of wildlife and the whole Shiga Prefecture, including our manufacturing site at Shiga, depend on it for their water supply.



🔍 Case study

1% Club at Gouda continuing to grow

Our employees at our Gouda manufacturing site in the Netherlands have always been keen to support their local community through 1% Club activities.

2016 saw six employees from a range of departments build a garden structure at a small community home for handicapped people. In addition to this, two employees organised a fundraising project for a local school and employees also supported Gouda city tours for handicapped people.



🔍 Case study

CBRN drill at Croda Germany

In 2016, our office in Germany held a fire exercise involving our own employees and volunteers from the Kaldenkirchen fire service.

This was in support of CBRN (Chemical, Biological, Radiological and Nuclear) incident awareness. The exercise was a great example of coordinated team working between the various local fire brigades and Croda.



🔍 Case study

Demonstrating the meaning of Prayas

The Prayas programme at our Thane manufacturing site in India continues to offer a wide variety of activities both internally and externally.

Such as, during 2016 on International Yoga Day a session on yoga and meditation gave employees the chance to appreciate how these techniques can be used to help relieve physical and mental stress; a half-day event where a doctor came on site focused on how to help prevent diabetes, the second most common disease in India, through lifestyle changes; and in December employees were able to contribute to the Christmas celebrations at a local community centre for underprivileged children.



Innovation every day



Energy efficiency

Our phase change materials can be incorporated into sportswear to help regulate body temperature, or into building materials to save energy and increase comfort.

Minimising environmental impact

Our textile finishing products help to reduce the amount of water and energy that manufacturers need when making high quality textiles for upholstery and clothing.

Saving energy

Our advanced material additives allow the particles used in the latest technologies for display screens to be evenly dispersed, which enable them to run at lower energy levels while still giving the best and brightest experience.

Prolonging product life

Our ingredients help the performance of lithium ion batteries and prolong product lifetimes, therefore reducing material needs and replacement costs.

Management and Governance

Delivering sustainability

Responsibility for shaping and delivering our sustainability programme reaches right across our Business; each and every one of our employees has a role to play, led by a dedicated senior management team.

Delivering sustainability, at every level of our Business

Our two most senior decision making bodies, the Board of Directors and Group Executive Committee, are ultimately responsible for our economic, environmental and social performance. As such, they play an active role in ensuring that sustainability remains an integral element of our Business strategy.

Our Vice President (VP) of Sustainability, who reports to our Group Chief Executive and President of Operations, manages our Global Sustainability Team and chairs our Global Sustainability Steering Committee, with the support of an Executive Sponsor.

A group of nine experts from specific areas of the Business sit on the Group Sustainability Steering Committee as Material Area Owners, representing our Business functions and the external stakeholder groups with whom they are most closely linked. Four Regional Representatives also sit on the Committee who, with the support of their own Regional Steering Committees, have a 360° role: cascading details of our activities globally to all employees, representing the needs of their regions and reporting back on the delivery of our programme.

Reporting progress

We have 44 reporting operations covering the whole Group, each with a Sustainability Champion who reports progress against our targets and a set of key performance indicators (KPIs). Along with details from our Material Area Owners, this information is communicated to the Group Executive Committee on a quarterly basis. The Board of Directors also receives quarterly summary reports, along with a number of bespoke presentations on key sustainability topics throughout the year, as it is an integral part of their agenda.

At our annual Sustainability Conference, which in 2016 took place in August, our sustainability programme was reviewed by the Group Executive Committee with the Global Sustainability Team and the Global Sustainability Steering Committee. No fundamental changes were made to our sustainability programme, but it was agreed at the meeting that we should structure this report to focus on our impact story, whilst continuing to manage our approach through our 10 Material Areas.

2016 reporting parameters

This report covers the sustainability performance of Croda International Plc for the period 1 January 2016 to 31 December 2016. The scope of this report is all wholly owned operations, plus those operations where we have significant management influence due to a majority shareholding. Unless otherwise stated, data provided throughout this report is for continuing operations.

In December 2015 we acquired Incotec Group BV and in May 2016 we bought the technology portfolio of Inventiva Ltda. Due to the timing and nature of these investments, our focus during 2016 has been to align and report their financial and Safety, Health, Environment and Quality performance. We have stated within this report where the activities of these operations have been excluded in our data while we work with them to embed our systems.



- » We have responded to GRI since 2008, all reports including that for 2016 can be downloaded at www.croda.com/GRI
- » Read about the Management and Governance of Croda International Plc in our 2016 Annual Report & Accounts at www.croda.com



Material Area Performance Summary



2016 performance

● Met ● Met in early 2017 ● Ongoing ○ New

Material Area	Target	Status	2016 Progress Summary
	Externally verify Group carbon and energy data from 2016	●	Work with our external verifiers, Carbon Smart, was completed in 2016 for our 2015 baseline year. At the end of the process we received limited verification of our scope 1, 2 and 3 emissions. Early 2017 saw us meet the same standard for 2016 data. Carbon Smart were complimentary about our practices with only a few recommendations to make to our calculation methods, which we have applied going back to 2015. p15
	Reduce total Group energy intensity by 5% by the end of 2020	●	We are currently ahead of target to achieve our five year energy intensity plan, which is based on our 'value added' (operating profit before depreciation and employee costs). To calculate energy intensity we divide energy consumption by value added, which for 2016 saw a 10.4% reduction compared to 2015. p16
	Generate 27% of the Group's total energy requirements from non-fossil fuel sources by the end of 2020	●	This challenging programme is currently on target as in 2016 we generated 21.3% of our energy requirements from non-fossil fuel sources. In 2016 our 2020 target was rebased from 30% to 27% following the external verification process carried out by Carbon Smart on our carbon and energy data. This is because we identified systematic changes that needed to be made to our fossil fuel calculations. p15
	Reduce total Group VOC emissions by 10% by the end of 2020	●	With a 11.4% reduction in VOCs in 2016 we are currently ahead of achieving this target. Through external verification of our carbon and energy data during the year we confirmed that our reported VOCs have little impact on our overall emissions. This means that moving forward, whilst we will keep VOC reduction as a target, activities in the area will be driven by economic and housekeeping factors rather than focusing on VOCs as a means to reduce GHG emissions. p16
	Reduce total Group water withdrawal by 10% by the end of 2020	●	Our 4.8% reduction in water consumption in 2016 means we are on target. The biggest single reduction was achieved at our Shiga manufacturing site in Japan, where investment to reduce water usage has contributed to a reduction in Group water consumption by 2%. We also started to implement new plans to further reduce the amount of water extracted and discharged at our Mevisa site in Spain. p16
	Reduce Group waste to landfill by 10% by the end of 2020	●	As of the end of 2016 we are on target to achieve our 2020 plan having achieved a 2.5% reduction in waste to landfill during the year. This is due to eight of our manufacturing sites sending zero waste to landfill, and our Gouda site in the Netherlands and our Mill Hall site in North America significantly reducing their waste from thousands to tens of tonnes. p16
	Ensure that all Basis of Safety documents comply with new internal standards by the end of 2016	●	By the end of 2016 we had met this target by carrying out a comprehensive review of all of our Basis of Safety documents to ensure that they comply with our new internal standards. All 17 eligible sites had also implemented these to achieve our Basis of Safety Strategic Milestone Plan. p17
	Embed our Process Safety Management System at all manufacturing sites by the end of 2016, and at any subsequent acquisitions within three years of final completion where appropriate, through relevant management training programmes	●	During 2016 our Process Safety Management System, which is an essential part of our investment into mitigating major risk to our Business, has now been implemented at all of our established manufacturing sites. We are also pleased to report that our recently acquired sites are making good progress and will have achieved full implementation within our target of three year post acquisition. We will maintain this time frame as an internal target going forward. p17

» Read more about our Material Areas and view our Materiality Matrix online at www.croda.com/sustainability

Material Area	Target	Status	2016 Progress Summary
	Ensure that all Process Risk Reviews are compliant with our internal quality targets by the end of 2018	🎯	We are on target to meet our 2018 deadline. At the end of 2016, 119 out of 192 Process Risk Reviews had achieved full compliance with Group standards. p17
	Conduct an independent review of our Process Risk Reviews (PRR) for high hazard processes by the end of 2020	🎯	We are currently on track to complete this target by 2020. During 2016, within the PRR framework, we completed quantified risk assessments of our highest hazard category of processes. In some cases this highlighted further improvements that we are now implementing. In addition, we agreed a protocol for completing the remaining peer reviews before 2020 in line with our target. p17
	Implement a Behavioural Safety Observation System across all manufacturing sites by the end of 2017	🎯	In 2016, all manufacturing sites are on target to deliver against our plan for implementation of this new system. p21
	Achieve a sustained OSHA Recordable (TRC) injury rate in the top quartile of chemical manufacturing companies with more than 1,000 employees	🎯	As of the end of 2016 we are on target to achieve this, following a re-basing of our historical data to OSHA reporting and identifying that we have achieved a marginal reduction in Total Recordable Injury Rate when compared to our 2015 performance. During 2016 we also saw a major improvement in the number of contractor injuries, which fell by 49% to the lowest rate in five years. p21
	Implement a programme of Interaction Management training for line managers to enable clear communications with employees about safe behaviours by the end of 2017	🎯	To complement our wider behavioural safety observation programme, we are on target to implement a two year Supervisory Competence Training programme, which is an interactive management course that was successfully piloted at our Rawcliffe Bridge site in the UK. Also, at higher levels in the organisation, we defined safety critical behaviours for Site Directors and more senior operations based roles to assist them in their setting of standards and personal development. p21
	Assess the social and environmental practices of our highest risk suppliers by the end of 2017	🎯	We are on target to achieve this through our partnership with Sedex to initially assess 200 of our suppliers based on the raw material they supply and their location. In 2016, we received a 70% response rate to our supplier questionnaire and started work on an initial risk assessment of these. 2017 will see us working alongside our newly formed Corporate Ethics Committee to agree next steps on this programme. p12
	Only supply RSPO certified palm oil ingredients by the end of 2017, subject to the feasibility of the supply chain	🎯	With 12 of our manufacturing sites now RSPO Supply Chain Certified to handle Sustainable Palm Oil raw materials we are making progress against our plan, although it is still subject to the development of our supply chain. As of the end of 2016, we have over 440 finished product codes available that support Certified Sustainable Palm Oil (CSPO) and more than 3,500 customer product combinations of CSPO derivatives, covering all geographical regions and all nine business areas. p10
	Implement a system that will facilitate the traceability of palm derived raw materials by the end of 2017	🎯	Having engaged with suppliers from whom we source 80% of our palm derivative volumes via face to face meetings and an online questionnaire, we are on target to meet our 2017 deadline. We achieved a 100% response rate to our questionnaire in 2016, and identified that transparency is known back to mill/refinery for palm oil derivatives and back to mills for palm kernel derivatives for 50% of the global volume of palm oil derivatives we use. p12

Material Area	Target	Status	2016 Progress Summary
	Measure our new products and key existing products against the 12 Principles of Green Chemistry throughout 2016	●	In meeting this target we applied a more robust procedure in 2016 to collect the data against all our Product Design targets. On average, our New and Protected Products (NPP) launched in 2016 scored 11.6 against the 12 Principles of Green Chemistry and our key existing products, the top 25 by value across our Business, met an average of 11.3 maintaining our consistently strong performance in this area. The focus of this target is now embedded in our Business and so we will continue to monitor and report against it as appropriate in the future. p09
	Identify any sustainability benefits in use of our new products and key existing products throughout 2016	●	In meeting this target we first confirmed that our Personal Care customers are most interested in the intrinsic sustainability of our products, where we focus on our leading positioning on the renewability of our raw materials and use the 12 Principles of Green Chemistry. For our Life Science and Performance Technology market sectors, extrinsic impacts are more important; of our top 25 products by value, in these sectors, 55% have a positive sustainability benefit in use. For new products developed in 2016 60% have extrinsic sustainability in use benefits. We are aware of many further customer applications where our products are used for their extrinsic sustainability benefits across all of the markets we serve, but these are in applications where we do not proactively promote these benefits, so they are excluded from these figures. p09
	Measure the renewable content of our new products throughout 2016	●	To meet this target we measure the renewability content of all products sold and new products launched. Through our engagement with customers, particularly in the Personal Care market, we know that there is great interest in the intrinsic sustainability of our products, by which we mean their renewable raw material content and the processes by which they are manufactured. In 2016, 62% of all raw materials used during the year were renewable. p08
	Using Life Cycle Assessment techniques, characterise the relevant environmental and social impacts of key product families by the end of 2018	○	This is a new target that we will start to implement during 2017 with the appointment of a specialist in the area.
	Ensure that our recent acquisitions in China and Italy meet ISO 9001:2000, ISO 14001:2004 and OHSAS 18001 by the end of 2016 and that any subsequent manufacturing acquisitions meet these minimum global standards within three years of final completion where appropriate	●	As of the end of 2016, all sites purchased more than three years ago had achieved OHSAS 18001 certification. All of our sites also met, in line with targets, ISO 14001:2004 environmental management system certification and ISO 9001:2000 quality management system certification. For our more recent Incotec and Inventiva sites, targets for certification have been set and will be rolled out going forwards as part of our future internal objective in this area. p18
	Apply the new Group Quality Manual throughout 2016	●	2016 saw us meet our target for our Group Quality Manual being communicated and implemented at all of our manufacturing sites. As part of this, all sites were required to do a gap analysis by the end of 2016, these are now in the process of being reviewed, which will continue throughout 2017. p18
	Gain EXCiPACT certification for another three manufacturing sites producing pharmaceutical excipients by the end of 2016	●	Last year we completed our Quality Assurance objective to have all manufacturing sites that supply significant quantities to the pharmaceutical sector certified to the EXCiPACT GMP standard. Singapore has been certified, whilst Mill Hall, Atlas Point and Shiga have been audited and are awaiting certification. This means that we have now achieved alignment with the status of our cosmetic ingredient sites, all of which had already achieved EEFci GMP certification in 2015. p09

» Read more about our Material Areas and view our Materiality Matrix online at www.croda.com/sustainability

Material Area	Target	Status	2016 Progress Summary
	Ensure that our major sales and distribution centres meet ISO 9001:2000 by the end of 2018 to further enhance delivery of quality services and products to our customers		We are on target to meet our 2018 plan having communicated this requirement to the sales and distribution centres in question, who made good progress in 2016. This is in recognition that these centres are a crucial part of our continued commitment to customer satisfaction. p18
	Implement a global coaching programme for our senior leaders by the end of 2016 to enable them to develop future leaders		As part of our focus on talent management, 'Coaching for Succession Planning' was completed by our Executive Committee members and also delivered to our European Regional Operations Board. Moving forward, the training will be provided on a request basis for business functions. p22
	Implement a structured development programme for our Specialists by end of 2016 to enhance their learning and progression		The framework for the Specialists Development Programme was designed in 2016 and will be launched in March 2017. It is a multi-modular programme that follows the same format as our existing Management Essentials Programme and will be delivered regionally. As demand for the programme is expected to be high, for the first intake we intend to select those that have been identified as high potential employees. p22
	Conduct regular global employee engagement surveys, with the first taking place in 2016		2016 saw us undertake a range of activities to develop a more in-depth understanding of our culture at all of our locations. As part of this objective, we completed preparations to hold a global survey to understand breadth and depth of any cultural differences, which will be rolled out in March 2017. p21
	Ensure that all employees have a formal annual appraisal by the end of 2017		We are on target for every employee to have a formal annual appraisal by the end of February 2017. 2016 saw our formal appraisal programme, Croda Aspire, gain more global buy-in than ever before, although we do anticipate completion of this target to be a challenge where we need to influence line manager behaviours. p22
	Develop a suite of best practice processes and training to enable better retention of knowledge within the Business by the end of 2017		We have made good progress and are on target to achieve this during 2017. Through the talent process we identified key risk areas and stakeholders with an action to mitigate these risks. We confirmed knowledge retention as a fundamental part of a manager's role by including it as a module in our Management Essentials Programme and it will also be included in the Specialists Development Programme. Raising awareness of the issue is currently being prioritised for all managers through coaching and development. p24
	Implement a Management Capability Programme to increase the capability of every manager within our Business in the areas of developing and retaining talent, knowledge sharing and maximising business performance by the end of 2018		We started work on this target during 2016 as we designed and implemented manager training in the area of developing and retaining talent. This is now being rolled out globally alongside the design and implementation of training in the remaining two areas of knowledge sharing and maximising business performance. p22
	Ensure that all locations have appropriate activities and policies to enable diversity in their workforce by the end of 2016		Through our reporting system, during 2016 all of our operations confirmed that they have met this target, resulting in a more inclusive system and diverse talent pool. This is helping us to identify the best candidates for development programmes, secondments and internal moves. We have also included a module in our 2020 Network Programme around cultural awareness. p23
	Develop and implement a bespoke training programme by the end of 2019 that will support our culture of inclusion, engagement and diversity		We will develop and implement this training programme following the completion of our global engagement survey, which takes place in March 2017.

Glossary

Report abbreviations

%	Percent	LMS	Learning Management System
°C	Degrees Celsius	LS	Life Sciences
ARA	Annual Report and Accounts	LTI	Lost time injury
bio-EO	Bio-Ethylene Oxide	m³	Cubic metre
CBRN	Chemical, Biological, Radiological and Nuclear	MW	Megawatt
CDP	Formerly 'Carbon Disclosure Project'	NPP	New and Protected Products
CEO	Chief Executive Officer	OHSA	Occupational Health and Safety Act
CO₂	Carbon Dioxide	OHSAS	Occupational Health and Safety Advisory Services
COP21	United Nations Paris Climate Change Conference in 2015	PC	Personal Care
CSPO	Certified Sustainable Palm Oil	Plc	Public Limited Company
D&I	Diversity and Inclusion	PPPs	Plant Protection Products
ECO Range	Environmentally Conscious Option range of bio-based products	PT	Performance Technologies
EEMEA	Eastern Europe, Middle East and Africa	PRR	Process Risk Review
EFfCI	European Federation for Cosmetic Ingredients	R&D	Research and Development
EO	Ethylene Oxide	RSPO	Roundtable on Sustainable Palm Oil
EXCiPACT	Certification scheme for pharmaceutical excipient suppliers	Sedex	Supplier Ethical Data Exchange
GHG	Greenhouse Gas	SPO	Sustainable Palm Oil
GJ	Gigajoule	SHE	Safety, Health and Environment
GMP	Good Manufacturing Practice	STEM	Science, Technology, Engineering and Mathematics
GRI	Global Reporting Initiative	Te	Tonne
HR	Human Resources	Te CO₂e	Tonne carbon dioxide equivalent
IC	Industrial Chemicals	the Principles	12 Principles of Green Chemistry
IMN	Industry Mentors Network	™	Trademark
IP	Intellectual property	TRC	Total Recordable Cases
ISO	International Organisation for Standardisation	UK	United Kingdom
J&J	Johnson and Johnson	USA	United States of America
kg	Kilogram	UV	Ultraviolet
KPI	Key Performance Indicator	VOC	Volatile Organic Compound
		VP	Vice President

Cautionary Statement

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